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ABSTRACT

The comparative effects of instruction in self-questioning, summarizing, and question-answer relations on reading comprehension test performance were studied with 49 juniors and seniors enrolled in a remedial reading course at Georgia State University. The objective was to find a method to help students pass a statewide college reading exit examination. In the item-writing training procedure, students were taught to write multiple-choice comprehension questions based on their reading, while the summary writing training followed Day's summarization rules. Finally, students were introduced to the taxonomy of question-answer relations using the "Will Wends His Way" passage and questions from Pearson and Johnson (1978). All students received 4 to 5 hours of instruction and practice per week for a month within the context of the class. Three evaluation measures were employed: the Basic Word Vocabulary Test during the first week, a practice form of the state exit reading comprehension examination during the last week, and the actual Regent's Reading examination. Students trained in discrening question-answer relations were more successful on reading comprehension tests than students trained in either summarizing or item writing. (SW)

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College Reading and Learning Assistance

Technical Report 85-03

Training Effects of Summarizing, Item Writing, and Knowledge of Information Sources on Reading Test Performance

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An initial report of this investigation was presented at the 34th Annual Meeting of the National Reading Conference.

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Training Effects of Summarizing, Item Writing and Knowledge of Information Sources on Reading Test Performance

Metacognitive processes during reading such as summarizing and self-questioning have been shown to be effective in transferring information into long-term recall (Flavell & Wellman, 1977) particularly when the reader processes the "right information" in the "right way" (Anderson & Armbruster, 1980). The application of comprehension monitoring techniques to the process of answering reading comprehension test questions has been advocated by Pearson and Johnson (1978) and Raphael (1984) in the form of awareness of question-answer relations. The question we have posed for this study is: What are the comparative effects of instruction in summarizing, self-questioning and question-answer relations on reading comprehension test performance?

Review of Research

An essential element of effective studying is the ability to estimate one's readiness to be tested. Two commonly reported sophisticated methods of testing one's level of comprehension and retention and, therefore, one's preparedness for a test, are to attempt to summarize or to question one's self over the material one has been reading (Brown, Campione & Day, 1981). A third, less common approach to test preparation is to develop one's sensitivity to sources of information for answering comprehension questions (Raphael, 1984). According to Armbruster and Brown (1984), good readers monitor and evaluate their comprehension and retention relative to the demands of the criterion task. Poor readers, on the other hand, are much less aware of the self-regulatory strategies for learning efficiently and effectively from text. Brown (1981) has concluded from her work that metacognitive processes are developmental in nature and that secondary and college students can be taught systematically metacognitive skills to help them learn from text.

With the development of the theories of metacognition and schema came major criticisms of previous research on questioning impelled by Rothkopf's mathemagenic hypothesis (1965). Critics contend that studying questioning as a text-inspection behavior is not fruitful because it will reveal very little about the mental processes that underlie this behavior and that Rothkopf-like questioning research lacks a theoretical foundation which would explicate the relationship between

cognitive processes and mathemagenics (Anderson & Biddle, 1975; Andre, 1979; Trabasso, 1981). Training in the skill of self-questioning during reading as a metacognitive process has shown promise (Andre & Anderson, 1978-79; Cohen, 1983; Wong & Jones, 1982). Singer and Donlan (1982) were successful in teaching eleventh grade students to derive story-specific questions from schema-general questions as a means of developing problem solving schema for comprehending short stories. Combining training in self-questioning and summarizing, Bean, Singer, Sorter and Frazee (1983), however, were not as successful in teaching eleventh graders to generate their own questions from expository prose passages based on a knowledge base presumed to have been acquired through following Day's summarization rules. In a study of self questioning reported by Duell (1978), college students were provided training in writing multiple-choice questions based on content objectives at different cognitive levels. By providing students with objectives, they were made aware of the reading task demands and could monitor their question-production relative to the objectives. On the criterion test, subjects who received higher and lower level objectives performed better than a control group.

Recent research with summarization has grown out of the theories of Kintsch and van Dijk (1978) and van Dijk and Kintsch (1978). Based on their postulation of three major rules for text comprehension and talk-aloud protocals of expert readers, Day (1980) developed summarization rules and found average and

remedial college students could be trained to use the rules. Specifically, she found that advanced students needed less explicit instruction than less advanced students, and that after training all subjects exhibited a greater use of the rules. Following this same line of research, a series of experiments conducted by Brown and Day (1983), Brown, Day, and Jones (1983), and Winograd (1984) provide further support for the developmental patterns that students of various ages demonstrate when preparing summaries. None of this research, however, was designed to determine whether training in making summaries would actually improve reading comprehension. More recently, King, Biggs and Lipsky (1984) compared the effectiveness of developing summaries or generating prequestions where the criterion tasks involved a free recall measure, an objective test and an essay test. While there were no significant differences between the treatment groups on the free recall measure and the objective test, the subjects undergoing the summarization training significantly outperformed their peers in the prequestioning group on the essay test of reading comprehension.

In a pilot study for this research (Stahl, Brozo & Gordon, 1983) remedial college students were trained to either create summaries according to Day's rules or construct multiple-choice questions from a table of specifications. Although the findings were not significant, both treatment groups outperformed a control group, using a traditional workbook approach, on a college exit examination of reading comprehension. In the

present study, we compared the effects of training in summarizing and self-questioning with a third condition, training in locating information sources for answering reading questions (Pearson & Johnson, 1978). According to Gordon (1982), students can be taught to reason through comprehension questions by employing problem solving schema. In a series of studies by Raphael (1984), students were taught about sources of information for answering comprehension questions which both sensitized them to the task demands of questions and also improved their ability to answer questions.

The purpose of the present study was to find an effective method which would improve students' chances for passing a statewide college reading exit examination. Given the short duration of our remedial course (five weeks) and the severe deficits of the participants, we are forced to either teach to the test, or rely on test-taking manuals or chapters from study-skills workbooks to teach test-taking skills. In either case, needed time for instruction in sound strategies for reading and learning from text is compromised seriously. We trained students to make summaries, write multiple-choice questions and discern question answer relations and postulated they would transfer these metacognitive skills to the process of taking the exit reading examination and consequently improve their performance.

METHOD

Materials and Procedures

Item-writing training procedure (IW). Students under this treatment condition were trained to write multiple-choice comprehension questions based on their reading. The process, a variation of the work by Duell (1978), involved the following steps:

1. Identify important information from the passage. Students were taught to focus on main ideas and relevant supporting details and isolate these portions of text through the use of underlining and marginal cues.

2. Build a simple table of specification which connects content with an appropriate question. Students were instructed to use a taxonomy of cognitive processing levels, namely literal, inferential and analytical, to match with the information identified in step one.

3. Consult available examples of question stems as a guide for writing new stems. Students analyzed copious examples of other items and were directed to identify those cases in which the wording in many item stems was repeated from passage to passage.

4. Develop a system for writing reponse options. Students modelled a system for generating distractors which drew upon incorrect information, irrelevant details and inconclusive ideas.

5. Write questions and gather feedback. Questions were exchanged and evaluated by other students and the instructor on

the bases of appropriateness and accuracy. Examples of well-written and poorly-written questions were put on transparancies and discussed.

The practice materials for the IW group were one page articles taken from a popular weekly news magazine.

Summary writing training procedure (SW). Students in this group were taught to follow Day's summarization rules. The process involved following five general steps to help in summary writing and five specific rules to follow in writing the actual summary. The general steps were:

1. Make sure you understand the text. The student tries to say the general theme of the text to him/herself.

2. Look back. The student rereads to reinforce understanding and to star important parts.

(at this point the student begins to follow the rules for writing a summary)

3. Rethink. The student rereads a paragraph of text to determine if the topic sentence was properly identified or written.

4. Check. The student rechecks lists and categories to include elements that were left out excise redundant elements from the summary.

Double check. The student conducts a final review of the summary to ensure inclusion of all important information.

The specific rules for writing a summary were:

1. Reduce lists. The student provides categories for

examples.

2. Use a topic sentence if one is given you. The student identifies topic sentences in paragraphs and includes them in the summary.

3. Make up your own topic sentence. The student writes a topic sentence for paragraphs without one and includes the topic sentences in the summary.

4. Get rid of repeated information. The student crosses out repeated information in the text.

5. Get rid of unimportant information. The student crosses out unimportant information in the text.

Students in the SW group applied this strategy to the same one page articles used by the IW group.

Question answer relations training procedure (QAR). Students were introduced to the taxonomy of question-answer relations using the "Will Wends His Way" passage and questions from Pearson and Johnson (1978). Due to the non-explicit nature of many college level reading test questions and answers, the Text Explicit category of the taxonomy was expanded to include any item answerable from a single sentence in the text: those explicitly cued, those with synonym substitutions or paraphrases [Johnston's (1981) modification], and those with neither question stem nor answer explicitly cued. The categories of Textually Implicit and Scriptally Implicit were not modified. With the Pearson and Johnson passage, students were shown how different answers can be supplied for the same question depending on

whether the information source came from the text or the readers background.

After the introduction, students practiced the question system using passages from textbooks, newspapers and magazines with teacher-generated multiple-choice items. At this stage in the training they were provided with the correct answers prior to reading the passages since the purpose was to practice identifying information sources for answering the items. With the first passage, students were directed to (1) mark the information in the text they would use to obtain the correct answer, (2) write down any prior knowledge neccesary to answer the item correctly and (3) classify each item. Responses were discussed at length, then the students were directed to follow the same procedure for the remaining passages. These passages were collected, examined by the instructor to ensure that the studentsunderstoodthetechnique and then feedbackwasprovided. The practice phase varied from the training phase only in that students, with new passages and items,had to answer the questions themselves. For any question answered incorrectly, the student was given the correct answer and directed to mark the information in the text and to provide the scriptal information when necessary. In the final week, students were not provided with the answers but were required to repeat the text marking/item classification procedure.

Students in all three conditions were provided four to five hours of instruction and practice per week over a four week

period within the context of the class. Daily assessment of students' papers provided evidence that they were employing and had learned their respective strategies.

Three measures were employed: (1) students completed the Basic Word Vocabulary Test [(BWVT) (1984)] during the first week; (2) during the fifth and final week of the course, students were administered a Practice Form of the state-wide exit examination of reading comprehension, a timed, standardized test made up of ten passages followed by a total of 58 multiple choice questions; (3) at the conclusion of the course, students took the actual state-wide Regent's Reading examination, a parallel version of the Practice Form. Students take this test outside the class in a formal setting under the supervision of a proctor, and test results are made avialable only in the form of scaled scores. Raw scores cannot be obtained.

Subjects

Forty-nine junior and senior-level college students enrolled in a remedial reading course at Georgia State University participated in the study. They comprised two groups of 16 students and one group of 17 students. The BWVT served as a covariate to statistically equalize the groups.

RESULTS

The first ANCOVA, with the BWVT as the covariate, was performed on the first measure of transfer, the Practice Form. The QAR group achieved a significantly higher mean score than the

other two groups, $F(2,45)=6.13$, $p<.01$. Means and standard deviations for the Practice Form are displayed in Table 1. An additional ANCOVA was performed on the second measure of transfer, the Regent's Reading test. The QAR and IW groups outperformed the SW group, $F(2,45)=5.54$, $p<.05$; however, there was no significant difference between the QAR and IW groups (see Table 2)

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insert table 1 about here

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insert table 2 about here

DISCUSSION

The study was designed to determine an efficient and effective method of preparing college students in a remedial reading course for a an exit examination of reading. Previous instructional practices had relied heavily on "how to" study skills manuals for test preparation or focused on teaching to the test while failing to inculcate reading strategies that promote independent problem-solving and self-evaluation. In a pilot study training in summarizing and self-questioning in the form of item writing proved superior to the traditional approach. In this study support was found for considering training in question

answer relations over summarizing and item writing as a means of instruction in our course. On the first measure of transfer, essentially a practice test for the actual Regent's reading test, the QAR group achieved significantly higher scores than both the IW and SW groups. On the actual exit examination, the Regent's, the QAR group significantly outperformed the SW group only. We have a possible explanation for the findings relative to the QAR group which is based on the principal of encoding specificity (Tulving & Thomas, 1973). According to this principal, the way in which information is encoded determines how it is stored and determines which retrieval cues will effectively access it. The implication of this principle for studying is that if the student knows the requirements of the criterion task and encodes the information in an optimal form to meet those requirements, task performance will be facilitated (Anderson & Armbruster, 1980). During training, the QAR group processed information in a form as close as possible to the requirements of the and transfer tasks. In fact, the sensitivity developed in the QAR group to information sources for answering comprehension questions was applied directly to the criterion and transfer tasks. This was not the case for the IW and SW groups. Neither could apply directly their newly learned processing skills due to the timed nature of both tests and especially under the controlled conditions in which the Regent's test is taken. The notion of encoding specifity helps explain the inferior performance of the SW group on the transfer tasks. King, et.al.

(1984) concluded that the effects of summary writing training can best be detected on tasks which resemble those required in training (written protocals, essays, summaries). Having students create summaries and write multiple-choice items may be requiring them to process the information in the "right way," that is, at a deep and meaningful level of involvement with the text; however, for this study, these text processing strategies could not be applied to the "right information," that is, on the transfer tasks. The evidence indicates that training in discerning question answer relations promotes comprehension skills necessary for good performance on multiple choice reading comprehension tests.

CONCLUSION

Remedial college students trained in discerning question answer relations were more successful on tests of reading comprehension as measured by multiple choice questions than students trained in either summarizing or item writing. Developing a sensitivity among students to information sources for answering comprehension questions may prove to be effective instruction in our preparatory course for the exit exam.

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TABLE 1

Results for Experimental Groups

on the Practice Form*

Group	n	Mean	Standard deviation
QAR	17	36.88	7.66
IW	16	31.69	6.81
SW	16	29.94	6.54

*Max. raw score=58; cut-off=37

TABLE 2

Results for Experimental Groups

on the Regent's Reading Test*

Group	n	Mean	Standard deviation
QAR	17	51.24	4.76
IW	16	61.19	3.85
SW	16	58.13	4.02

*Max. scale score=99; cut-off=61

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